

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 890003-2006.WO	FOR FURTHER ACTION	See item 4 below
International application No. PCT/US2004/021553	International filing date (<i>day/month/year</i>) 02 July 2004 (02.07.2004)	Priority date (<i>day/month/year</i>) 02 July 2003 (02.07.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant REGENTS OF THE UNIVERSITY OF MINNESOTA		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Date of issuance of this report 07 June 2006 (07.06.2006)
Facsimile No. +41 22 740 14 35	Authorized officer <div style="text-align: center; font-weight: bold; font-size: 1.2em;">Masashi Honda</div>
Telephone No. +41 22 338 70 10	

PATENT COOPERATION TREATY

REC'D 23 MAR 2006

WIPO

PCT

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
WILLIAM F. LAWRENCE
FROMMER LAWRENCE & HAUG LLP
745 FIFTH AVENUE
NEW YORK, NY 10151

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference 890003-2006.WO		Date of mailing (day/month/year) 20 MAR 2006
FOR FURTHER ACTION See paragraph 2 below		
International application No. PCT/US04/21553	International filing date (day/month/year) 02 July 2004 (02.07.2004)	Priority date (day/month/year) 02 July 2003 (02.07.2003)
International Patent Classification (IPC) or both national classification and IPC IPC(7): G01N 33/569; C12N 5/00, 5/02 and US Cl.: 435/7.21,325		
Applicant REGENTS OF THE UNIVERSITY OF MINNESOTA		

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Date of completion of this opinion 03 February 2006 (03.02.2006)	Authorized officer Chang-Yu Wang Telephone No. 571-272-1600
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------	---------------------------------------------------------------------------

Form PCT/ISA/237 (cover sheet) (April 2005)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US04/21553

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

- ☒ the international application in the language in which it was filed .
- ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
- ☐ table(s) related to the sequence listing

b. format of material

- ☐ on paper
- ☐ in electronic form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
- ☐ filed together with the international application in electronic form.
- ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/21553

Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>10</u>	YES
	Claims <u>1-9 and 11-13</u>	NO
Inventive step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-13</u>	NO
Industrial applicability (IA)	Claims <u>1-13</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations:

Claims 1-9 and 11-13 lack novelty under PCT Article 33(2) as being anticipated by US Patent No. 6284539 and WO02086073. Both US 6284539 and WO02086073 teach a method of differentiating neural stem cells into dopaminergic neurons under a culture condition containing FGF8, sonic hedgehog, BDNF and astrocytes. (see column 2, lines 15-68 and column 9 section B. cell culture in US6284539, and claims 1-3, 5, 7-10). WO02086073 teach differentiating human embryonic stem cells into dopaminergic neurons (see claims 1-3, 5, 7-10, paragraphs [14][15][20], figures 1A-1E, 5). US 6284539 also teach neuronal cells derived from the method of differentiation of neural stem cells into dopaminergic neurons. The method also include neural stem cells differentiated into serotonergic neurons and GABAergic neurons.

Claims 1-13 lack an inventive step under PCT Article 33(3) as being obvious over US Patent 6284539 in view of US20030059939. US patent 6284539 teaches as set forth above but fails to the stem cells are isolated from bone marrow or blood. US20030059939 teaches that differentiating human adult fibroblast into GABAergic neurons (see paragraphs [0090],[0091][0097] and Examples 1-3). US20030059939 further teaches several somatic cells can be trans-differentiated into neurons. These cells including bone marrow. It would have been obvious for a skilled artisan to differentiate bone marrow into neurons under the culture condition of differentiating neural stem cells into neurons.

Claims 1-13 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.